

## Self Healing Coating/Film (KSC)

Completed Technology Project (2014 - 2014)



## Project Introduction

Kennedy Space Center (KSC) has been developing self healing materials and technologies. This project seeks to further develop self healing functionality in thin films for applications such as corrosion protective coatings, inflatable structures, space suit materials, and electrical wire insulation.

Self healing technologies could significantly increase material/system reliability, reduce life cycle costs, and improve operational safety. Kennedy Space Center (KSC) has been developing self-healing technologies and has established intellectual properties in this area. One of KSC's approaches is encapsulating healants in microcapsules with spherical and elongated shapes so that the contents can be released automatically when the system is damaged. The other approach involves synthesizing and utilizing polymers that are capable of self-sealing when mechanical damage, such as a scratch, occurs.

## Anticipated Benefits

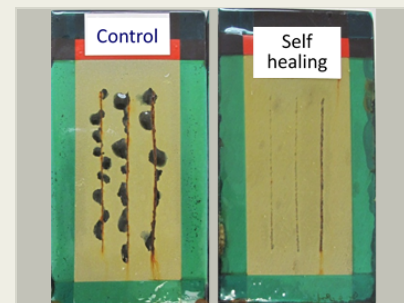
- increase material/system reliability
- reduce life cycle costs, and
- improve operational safety

Self-healing, multi-functional materials have been identified as critical technologies for increased sustainability and reliability in space exploration. NASA and the aerospace community still lack self-healing capabilities in systems such as wiring, protective coatings and habitation structures.

When developed, this technology will add new functionality, reduce life cycle cost, increase the safety and reliability of deep space missions, as well as benefit the public after commercialization in such areas as coatings, medical, electronic and composites industries.

Self healing materials and technologies can have game changing impacts for deep space exploration and habitation missions, as well as commercial aviation and the oil industry.

Technology advances in self healing and wire insulation materials can benefit many other government agencies such as the US Department of Defense, Department of Transportation, and Department of Energy.



1000 hour salt fog testing result

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## Organizational Responsibility

### Responsible Mission Directorate:

Mission Support Directorate (MSD)

### Lead Center / Facility:

Kennedy Space Center (KSC)

### Responsible Program:

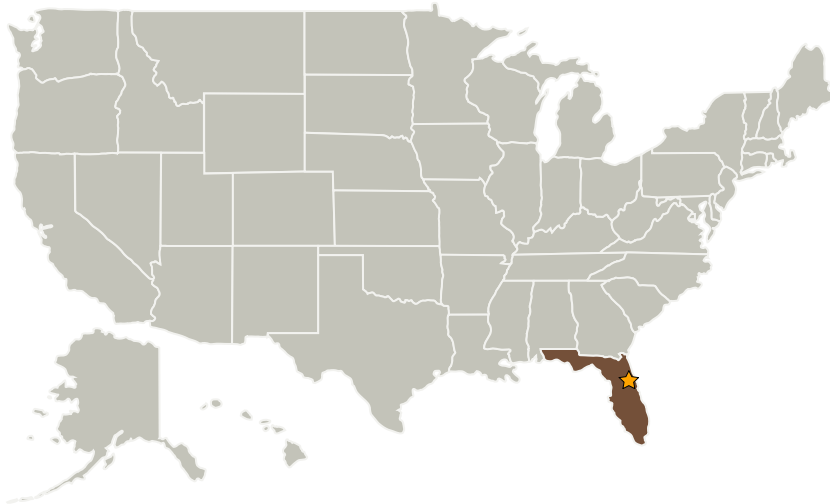
Center Independent Research & Development: KSC IRAD

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## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
QinetiQ North America(QNA)	Supporting Organization	Industry	

## Primary U.S. Work Locations

Florida

## Project Management

**Program Manager:**

Barbara L Brown

**Project Manager:**

Pamela A Mullenix

**Principal Investigators:**

Martha K Williams

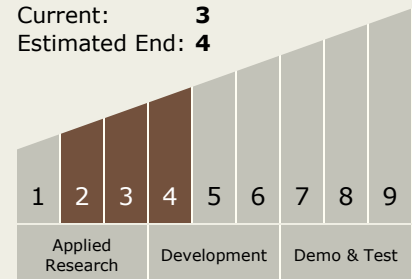
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## Technology Maturity (TRL)

Start: 2

Current: 3

Estimated End: 4



## Technology Areas

**Primary:**

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.1 Materials
    - └ TX12.1.6 Materials for Electrical Power Generation, Energy Storage, Power Distribution and Electrical Machines

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### Images



#### **Control and self healing coating after 1000 hour salt fog testing**

1000 hour salt fog testing result  
(<https://techport.nasa.gov/image/4062>)